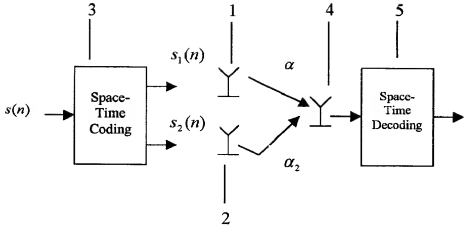

Figure1: Prior Art

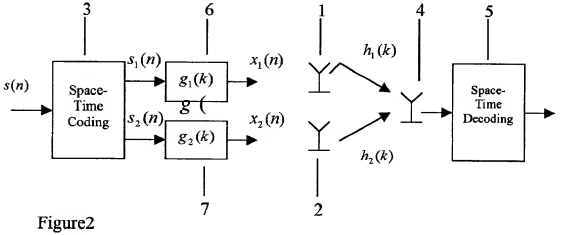

Figure2

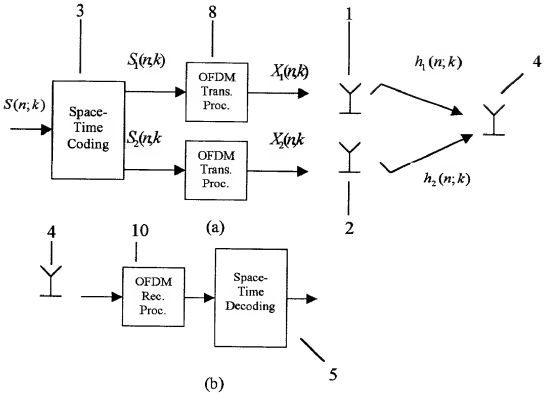

Figure3: Prior Art

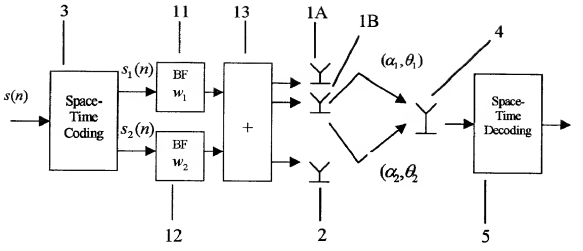

Figure4: Prior Art

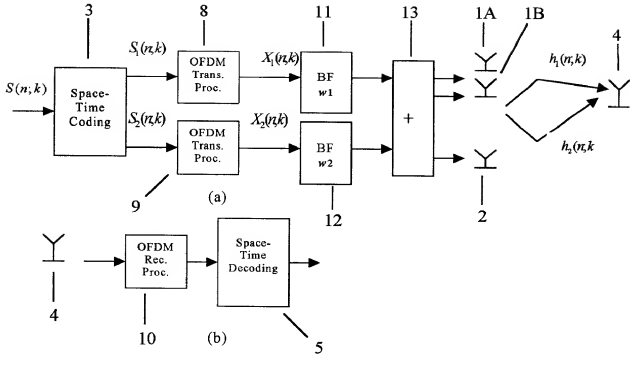
3
8
11
13
1A
1B
4
$S(n;k)$
Space-Time Coding
$S_1(n;k)$
$S_2(n;k)$
OFDM Trans. Proc.
OFDM Trans. Proc.
$X_1(n;k)$
$X_2(n;k)$
BF w1
BF w2
+
$h_1(n;k)$
$h_2(n;k)$
9
(a)
12
2
4
OFDM Rec. Proc.
Space-Time Decoding
10
(b)
5

Figure5

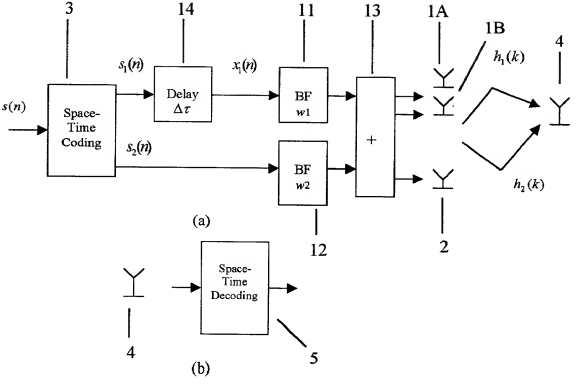
3
14
11
13
1A
1B
4
$h_1(k)$
$s_1(n)$
$x_1(n)$
$s(n)$
Space-Time Coding
Delay $\Delta\tau$
BF $w1$
+
$s_2(n)$
BF $w2$
$h_2(k)$
(a)
12
2
Space-Time Decoding
4
5
(b)

Figure6

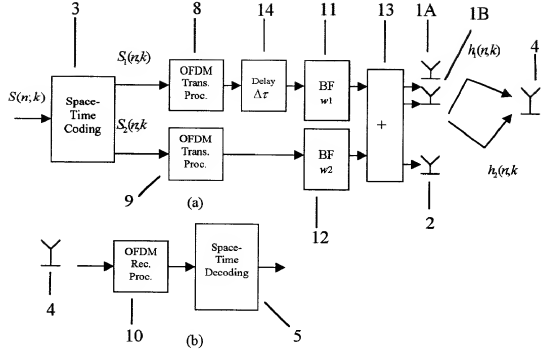
3
8
14
11
13
1A
1B
4
$S(n;k)$
Space-Time Coding
$S_1(n,k)$
$S_2(n,k$
OFDM Trans. Proc.
OFDM Trans. Proc.
Delay $\Delta\tau$
BF $w1$
BF $w2$
+
$h_1(n,k)$
$h_2(n,k$
9
(a)
12
2
4
OFDM Rec. Proc.
Space-Time Decoding
10
(b)
5

Figure7

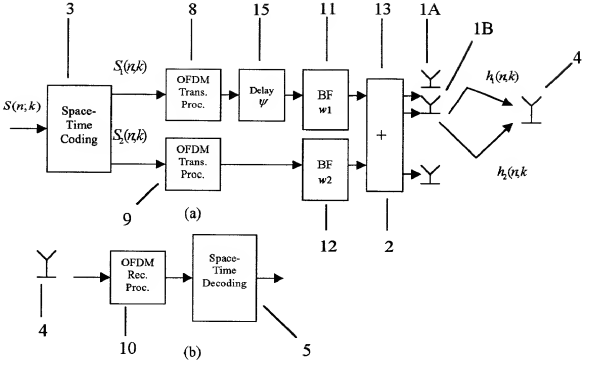
3
8
15
11
13
1A
1B
4
S(n,k)
S(n;k)
Space-Time Coding
S1(n,k)
S2(n,k)
OFDM Trans. Proc.
OFDM Trans. Proc.
Delay ψ
BF w1
BF w2
+
h1(n,k)
h2(n,k
9
(a)
12
2
4
OFDM Rec. Proc.
Space-Time Decoding
10
(b)
5

Figure8

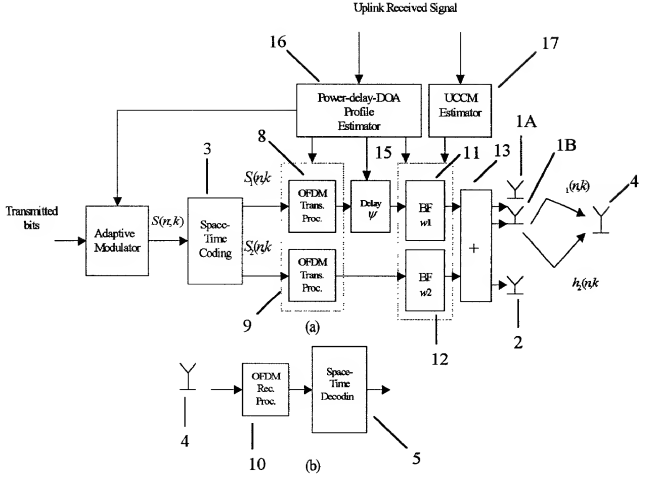
Uplink Received Signal
16
17
Power-delay-DOA Profile Estimator
UCCM Estimator
1A
1B
8
3
15
11
13
4
Transmitted bits
Adaptive Modulator
S(n,k)
Space-Time Coding
OFDM Trans. Proc.
Delay
BF w1
BF w2
+
9
(a)
12
2
OFDM Rec. Proc.
Space-Time Decodin
10
(b)
5

Figure9